

CLAIMS

1. A method of driving a brushless DC motor comprising:
rectifying an AC voltage by a rectifier circuit, a capacitor being
5 coupled between output terminals of the rectifier circuit and the AC voltage of an AC
power source being input to the rectifier circuit;
driving the brushless DC motor by an inverter coupled to the rectifier
circuit;
detecting a rotor position of the brushless DC motor by a position
10 detector based on one of a back electromotive force of the brushless DC motor and a
motor current;
estimating the rotor position by a position estimator when the rotor
position is not detectable by the position detector; and
controlling the inverter by a controller based on one of the rotor
15 position detected by the position detector and the rotor position estimated by the
position estimator.
2. The method of driving the brushless DC motor as defined in Claim
1, wherein the capacitor has a capacitance that a ripple content in an output voltage of
20 the rectifier circuit becomes not less than 90% in an output range for practical use in
driving the brushless DC motor.
3. The method of driving the brushless DC motor as defined in Claim
1, wherein a predetermined time is specified based on a detection time when the rotor
25 position is detectable by the position detector, and the rotor position is estimated on a

precondition that the position shifts after the predetermined time when the rotor position is not detectable by the position detector.

4. The method of driving a brushless DC motor as defined in Claim 1,
5 wherein the rotor position is judged undetectable by the position detector when an output voltage of the rectifier circuit is lower than a predetermined voltage.

5. A brushless DC motor driver comprising:
a rectifier circuit for rectifying an AC voltage input from an AC power
10 source, the rectifier circuit being configured with a diode bridge circuit;
a capacitor coupled between output terminals of the rectifier circuit;
an inverter coupled to the rectifier circuit;
a position detector for detecting a rotor position of the brushes DC
motor based on one of a back electromotive force of the brushless DC motor driven
15 by the inverter and a motor current;
a position estimator for estimating the rotor position when it is not
detectable by the position detector; and
a controller for operating the inverter by switching between an output
signal from the position detector and an output signal from the position estimator.

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6. The brushless DC motor driver as defined in Claim 5, wherein the inverter is configured with six switching elements in a three-phase bridge connection.

7. The brushless DC motor driver as defined in Claim 5, wherein the
25 capacitor has a capacitance that a ripple content in an output voltage of the rectifier

circuit becomes not less than 90% in an output range for practical use in driving the brushless DC motor.

5 8. The brushless DC motor driver as defined in Claim 5, wherein the position estimator has a timer, the position estimator specifying a predetermined time based on a detection time when the rotor position is detectable by the position detector, and determining an estimated rotor position using the timer when the rotor position is not detectable by the position detector.

10 9. The brushless DC motor driver as defined in Claim 5, wherein a voltage across the capacitor is detected, and an output from the position estimator is used for operating the inverter when the detected voltage is lower than a predetermined voltage.

15 10. The brushless DC motor driver as defined in Claim 5, wherein the brushless DC motor drives a compressor in a refrigerating and air conditioning system.

20 11. The brushless DC motor driver as defined in Claim 5, wherein the brushless DC motor drives an air blower for feeding air.